Rhode Island Department of Health
Three Capitol Hill
Providence, RI 02908-5094

www.health.ri.gov

Center for Epidemiology and Infectious Diseases

Advisory

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To: Infectious Disease Physicians/ Infection Control Practitioners/Hospital laboratories

Re: Vancomycin-Intermediate Resistant *Staphylococcus aureus* (VISA), Rhode Island 2008

This public health report describes the second *Staphylococcus aureus* (*S. aureus*) isolate with reduced susceptibility (intermediate resistance) to vancomycin to be reported in Rhode Island. The first such isolate was reported was in 1998.[1] The 2008 isolate was recovered from a hemodialysis patient with recurrent methicillin-resistant *S. aureus* (MRSA) bacteremia and an undrained paravertebral abscess. The patient had repeatedly signed out of the hospital against medical advice and had declined surgery to drain the abscess. In addition, outpatient vancomycin serum levels were suboptimal. The Vancomycin-intermediate *S. aureus* isolate was found in a single blood culture. This isolate also had reduced susceptibility to daptomycin, but was sensitive to linezolid, tetracycline, trimetoprime/sulfa, and tetracycline in vitro.

What is VISA?

Vancomycin-Intermediate *Staphylococcus aureus* (VISA) was first recognized in Japan in 1996.[2] Several subsequent reports followed in the United States [3,4], Canada [5], Europe [6], Korea [7] and Brazil [8]. This bacteria has been identified in several states across the country including the New England area, and is susceptible to other currently available antibiotics. Colonization of healthcare workers and family members has not been reported. *Staphylococcus aureus* is a bacterium that commonly causes infections in community and healthcare settings. The degree of resistance to vancomycin is determined by the minimum inhibitory concentration (MIC) using the breakpoints established by the Clinical and Laboratory Standards Institute (CLSI) and approved by the Food and Drug Administration (FDA):

- MIC $\leq$ 2 mcg/ml = vancomycin sensitive *S. aureus* (VSSA)
- MIC 4-8 mcg/ml = vancomycin intermediate *S. aureus* (VISA)
- MIC $\geq$16 mcg/ml = vancomycin resistant *S. aureus* (VRSA)

What is VRSA ?

Vancomycin-resistant *S. aureus* (VRSA) is a *Staphylococcus aureus* bacterium that is resistant to vancomycin (MIC $\geq$16 mcg/ml). This means that the antibiotic vancomycin will not be effective in treating someone with a VRSA infection. Only 10 cases of VRSA have been reported worldwide.
Typically, VRSA is a *Staphylococcus aureus* bacterium that has acquired vancomycin resistance genes from vancomycin-resistant *Enterococcus faecalis*, and is usually seen in patients who have mixed infections

with both organisms. Thus far, VRSA isolates reported in the literature have been fully susceptible to daptomycin and linezolid.

Is this VISA contagious?

VISA is no more likely to be transmitted from person-to-person than is MRSA. Contact precautions and adherence to hand hygiene are appropriate for healthcare personnel and family members.

How is VISA spread?

The most common way *Staphylococcus aureus*, including VISA, can be spread is by direct contact with someone who is colonized or infected without performing hand hygiene afterwards. Touching a surface, such as a hospital bed or table, that has the bacteria on it may also spread *Staphylococcus aureus*, including VISA.

Why did this VISA isolate come about?

Treatment of a methicillin resistant *Staphylococcus aureus* (MRSA) infection with vancomycin has been associated with the emergence of subpopulations of MRSA that have thicker cell walls and a reduced susceptibility to vancomycin. Cross-resistance to daptomycin has also been reported. This is likely to occur in infections that required prolonged courses of vancomycin or in which adequate drainage of the site of infection has not been accomplished.

What can I do to prevent my patients from developing VISA?

It is important to maintain therapeutic serum concentrations of vancomycin during therapy of MRSA. National guidelines from the Infectious Diseases Society of America (IDSA) and other treatment guidelines recommend a therapeutic vancomycin trough between 10 to 20 mcg/ml depending on the infection site.[9-11] Adequate drainage of abscesses, debridement of devitalized infected tissues, and removal of infected hardware may shorten the required treatment duration and reduce risk of emergence of antibiotic resistance, such as VISA or VRSA. Consultation with an Infectious Disease Specialist is recommended to ensure optimal management of invasive or otherwise complicated MRSA infections.

What do I do if my patient has a VISA isolated?

VISA and VRSA infections are reportable diseases in Rhode Island. Therefore, upon recognition or strong suspicion, VISA or VRSA must be reported immediately by laboratories, licensed clinicians and infection control practitioners. **C**ontact the Rhode Island Department of Health by fax (401-222-2488) or by phone (401-222-2577 during working hours, 401-272-5952 after hours) or by other prescribed secured electronic means. RI Licensed laboratories must submit the suspect isolate to the State laboratory for confirmation and further testing.
Rules and regulations pertaining to the reporting of communicable diseases can be found at :
http://www2.sec.state.ri.us/dar/regdocs/released/pdf/DOH/5335.pdf

Where can I learn more about VISA?

The Centers of Diseases Control and Prevention (CDC) has a web site for VISA / VRSA: Vancomycin-Intermediate/Resistant *Staphylococcus aureus*

http://www.cdc.gov/ncidod/dhqp/ar_visavrsa_data.html

http://www.cdc.gov/ncidod/dhqp/pdf/ar/visa_vrsa_guide.pdf

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